

CURRICULUM VITAE

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NAME: KIPYEGON KOECH RICHARD

Personal Information

- Nationality: Kenyan
- ID No: 23656091
- Gender: Male
- Date of birth: Dec 23rd, 1983
- Marital Status: Married
- Religion: Christian
- Language: English and Kiswahili



Academic Background

2018 - 2022: African University of Science and Technology: Doctor of philosophy in Material Science and Engineering (Energy)

Thesis Title: Additives effects on the charge carrier dynamics and performance metrics of Formamidinium-rich mixed lead halide perovskite solar cell

2019 – 2021: Worcester Polytechnic Institute:

Visiting Research Scholar: Research on perovskite solar cells

2009 - 2012: Chepkoilel University College (Currently University of Eldoret): Master of Science in physics (Renewable energy option)

Thesis Title: A parametric study of a thermosiphon photovoltaic/thermal air system

2004 - 2008: Egerton University: Bachelor of Education (Science)

- Obtained first Class Honors

1999 - 2002: Gorgor High School: Kenya Certificate of Secondary Education (KCSE).

- Obtained A- (Minus)

1991 - 1998: Gorgor Primary School: Kenya Certificate of Primary Education (KCPE).

- Obtained 455 out of 700

Computer Proficiency:

Basic Packages: Introduction MS-Windows, Microsoft office: MS-Word, MS-Excel, Access, internet and Power point, Acrobat reader, Linux among others.

Programming Language: Fortran, MATLAB and Python

Career Objective

- To fully engage my professional resourcefulness in setting desirable standards geared towards the realization of both broad and specific objectives within my field of practice and employment.

Other qualifications

- 26th – 27th June, 2023: Workshop on Energy and Sustainable Development, organized by Energy Cluster, Orleans University & Polytechnic School of Abomey-Calavi (EPAC), Benin
- 31st May – 1st June, 2023: Workshop on EAC programme accreditation, organized by IUCEA; Safari Club Hotel, Nairobi
- 6th – 10th March, 2023: Academic, Professional and Administrative Staff (APAS) training workshop, organized by CARTA, Moi university-Annex Campus, Eldoret
- 17th - 20th, October 2022: DSI-NRF-CNRS Workshop on research for impact- strengthening scientific collaboration between Africa and Europe, Future Africa Campus, Pretoria.
- 18th - 20th, August 2021: RSIF Training Workshop: Information Literacy and Reference Management, Organized by RSIF-Regional Coordination Unit-ICIPE
- 5th -9th, July 2021: Scientific paper writing and publishing workshop, organized by APHRC and ICIPE
- 18th - 20th August 2021: RSIF Information Literacy Training
- 19th, May 2021: Laboratory safety training organized by Worcester Polytechnic Institute (WPI)
- 7th May 2021: Making the most out of science direct (Elsevier) including research workflow management
- 19th-20th May 2021: Technical Monitoring and evaluation organized by ICIPE
- 16th-20th November 2020: Research Methods and Statistics, data management and analysis organized by ICIPE
- 12th-13th November,2020: Scientific Communication: presentation, posters and pitching organized by ICIPE
- 23rd-24th September 2020: Monitoring and Evaluation organized by ICIPE
- 7th -13th July, 2020: SDGs, Learning, training and practice workshop: Hosted by UNITAR and the Division for Sustainable Development Goals, at the United Nations Department of Economic and Social Affairs.
- 1st & 3rd, June 2020: Author Workshop: Article and Book publishing Process, A webinar organized by Elsevier Africa.
- 17th - 28th, June 2019: Participated in entrepreneurship Boot camp held in African University of Science and Technology, Abuja-Nigeria.
- 25th, June, 2020: Workshop on plagiarism: Decision making and dealing with grey zone across academic fields; webinar organized by Elsevier Africa.
- 1st & 3rd June, 2020: Author Workshop: Article and Book publishing Process, A webinar organized by Elsevier Africa.

- 10th – 20th, December 2018: Attended a workshop on sustainable energy materials held in Kampala in Uganda organized by JUAMI.
- 20th – 24th, August 2018: Participated in the Pan African School of Materials (PASMATV) Workshop.
- 21st, June 2018: 2018 Special Materials Lecture. **Theme:** Development of secondary raw materials for global competitiveness held at Raw Materials Research and Development Council (RMRDC) Auditorium, Maitama, Abuja.

Work Experience	Period	Institution	Position
	Dec 2022 – Date	Moi University	Lecturer
	Aug 2014- Dec,2022	Moi University	Tutorial Fellow
	2011-Aug 2014	Mt. Kenya University	Part-time lecturer

Published Book Chapters

- N. Chepngetich, G.M. Mumbi, G.M. Meheretu, R. K. Koech, G.K. Yegon, S.C. Chepkwony, C.K Rono, D. Sanni, A. Bello and E. Ntsoenzok (2024). Recent trends on the application of phytochemical-based compounds as additives in the fabrication of perovskite solar cells, *Energy Advances*, 3, 741 - 764
- Oyewole, Oluwaseun K., Oyelade, Omolara V., Ichwani, Reisia, **Koech, Richard**, Oyewole, Deborah O., Cromwell, Jaya, Olanrewaju, Yusuf and Soboyejo, Winston O. (2023) Mechanical Properties of Solar Cell Structures. In: Aliabadi, Ferri M H and Soboyejo, Winston (eds.) *Comprehensive Structural Integrity*, 2nd Ed., vol. 10, pp. 185–208. Oxford: Elsevier.
- Oyewole, Oluwaseun K., Adeniji, Sharafadeen A., Oyewole, Deborah O., **Koech, Richard**, Oyelade, Omolara V., Cromwell, Jaya, Olanrewaju, Yusuf, Bello, Abdulhakeem and Soboyejo, Winston O. (2023) Fatigue of Flexible and Stretchable Electronic Structures. In: Aliabadi, Ferri M H and Soboyejo, Winston (eds.) *Comprehensive Structural Integrity*, 2nd Ed., Vol. 4, pp. 266–285. Oxford: Elsevier
- Bello, Abdulhakeem, Ahmed, Ridwan A., **Koech, Richard**. K., Orisekeh, Kingsley, Sanni, Dahiru M., Kigozi, Moses, Anye, Vitalis, Oyewole, Oluwaseun K. and Soboyejo, Winston O. (2023) The Mechanical Properties of Batteries and Supercapacitors. In: Aliabadi, Ferri M H and Soboyejo, Winston (eds.) *Comprehensive Structural Integrity*, 2nd Ed., vol. 10, pp. 308–348. Oxford: Elsevier.

Publications

- Naomy Chepngetich, Gloria M. Mumbi, Getnet Meheretu M., **Koech K. Richard**, Geoffrey K. Yegon, Sarah C. Chepkwony, Charles Rono K., Dahiru Sanni e, Abdulhakeem Bello and Esidor Ntsoenzok (2024). Recent trends on the application of phytochemical-based compounds as additives in the fabrication of perovskite solar cells, *Energy Adv.*, 2024, 3, 741-764
- Dahiru M Sanni, **Richard K Koech**, Abdulhakeem Bello, Uchenna C

Obi, Sharafadeen A Adeniji, Omolara V Oyelade (2023). Solvent Vapor Annealing of CH₃NH₃PbI₃ Films for Improved Photovoltaic Performance of Perovskite Solar Cells, *Proc. 2nd International Conference on Multidisciplinary Engineering and Applied Science (ICMEAS), IEEE*

- Dahiru M Sanni, **Richard K Koech**, Abdulhakeem Bello, Uchenna C Obi, Sharafadeen A Adeniji, Omolara V Oyelade (2023). Enhancing Perovskite Film Properties Through Solvent Annealing Techniques, *Proc. 2nd International Conference on Multidisciplinary Engineering and Applied Science (ICMEAS), IEEE*
- Cyril CF Kumachang, Daniel I Amune, Ivy M Asuo, Dahiru Sanni, Yusuf A Olanrewaju, Nicole Doumit, **Richard Koech**, Vitalis Anye, Esidor Ntsoenzok, Nutifafa Y Doumon (2023). The Effect of Transient Power Ramp-Up on Structural and Optical Properties of CuO Thin Films Prepared by Radio Frequency Magnetron Sputtering, *Adv. Energy Sustainability Res.* 2023, 2300258
- Moses Kigozi, **Richard K Koech**, Kingsley Orisekeh, Ravi Kali, Omar LM Kamoga, Balaji Padya, Abdulhakeem Bello, Gabriel N Kasozi, Pawan Kumar Jain, John Baptist Kirabira, Azikiwe Peter Onwualu, Nelson Y Dzade (2023). Porous carbon derived from Zea mays cobs as excellent electrodes for supercapacitor applications, *Open J Anal Bioanal Chem* 7(1): 001-010. DOI: <https://dx.doi.org/10.17352/ojabc.000028>
- Yusuf A. Olanrewaju, **Richard K. Koech**, Omolara V. Oyelade, Ridwan A. Ahmed, Reisyah Ichwani, Abraham I. Ebinu, Jaya Cromwell, Abdulhakeem Bello, Vitalis C. Anye, Oluwaseun K. Oyewole, and Winston O. Soboyejo (2022): Thermally induced failure mechanisms in double and triple cations perovskite solar cells, *AIP Advances*, 12, 085014
- **Richard K. Koech**, Yusuf A. Olanrewaju, Reisyah Ichwani, M. Kigozi, Deborah O. Oyewole, Omolara V. Oyelade, Dahiru M Sanni, Sharafadeen A. Adeniji, Erika Colin Ulloa, Lyubov V. Titova, Julia L. Martin, Ronald L. Grimm, Abdulhakeem Bello, Oluwaseun K. Oyewole, Esidor Ntsoenzok and Winston O. Soboyejo (2022): Effects of Polyethylene Oxide Polymer on the photo-physical properties and operational stability of FA-Rich perovskite solar cells, *Scientific Report*, 12, 12860
- R. Ichwani, V. Uzonwanne, A. Huda, **R. Koech**, O. K. Oyewole and W. O. Soboyejo (2022): Adhesion in perovskite solar cell multilayer structures, *ACS Applied Energy Materials*, 5, 5, 6011–6018
- Jaya Cromwell, Sharafadeen Adeniji, Deborah Oyewole, **Richard Koech**, Reisyah Ichwani, Benjamin Agyei-Tuffour, Oluwaseun Oyewole, and Winston Soboyejo (2022). Effects of Blister Formation on the Degradation of Organic Light Emitting Devices, *AIP Advances*, 12, 035308
- Omolara Oyelade, Oluwaseun Oyewole, Yusuf Olanrewaju, Reisyah Ichwani, **Richard Koech**, Deborah Oyewole, Sharafadeen Adeniji, Dahiru Sanni, Jaya Cromwell, Ridwan Ahmed, Kingley Orisekeh, Vitalis

Anye, and Winston Soboyejo (2022): Understanding the Effects of Annealing Temperature on the Mechanical Properties of Layers in FAI-Rich Perovskite Solar Cells, *AIP advances*, 12, 025104

- Yusuf Olanrewaju, Kingsley Orisekeh, Omolara Oyelade, **Richard Koech**, Reisya Ichwani, Abraham Ebunu, Daniel Amune, Abdulhakeem Bello, Vitalis Anye, Oluwaseun Oyewole, and Winston Soboyejo (2022): Effects of Temperature-Dependent Burn-In Decay on the Performance of Triple Cation Mixed Halide Perovskite Solar Cells, *AIP advances*, 12, 015122
- Reisya Ichwani; **Richard Koech**; Oluwaseun Kehinde Oyewole; Adri Huda; Deborah Olubunmi Oyewole; Jaya Cromwell; Julia L. Martin; Ronald L. Grimm (2022). Interfacial Fracture of Hybrid Organic-Inorganic Perovskite Solar Cells; *extreme mechanics letters*, Vol. 50, 101515
- **Richard K. Koech**; Reisya Ichwani; Deborah O. Oyewole; Moses Kigozi; Daniel Amune; Dahiru Sanni; Sharafadeen A. Adeniji; Oluwaseun K. Oyewole; Abdulhakeem Bello; Esidor Ntsoenzok; Winston Soboyejo (2021): Tin Oxide modified Titanium Dioxide as Electron Transport Layer in Formamidinium-Rich Perovskite Solar Cells, *Energies*, 14(23), 7870;
- **Richard K. Koech**, Reisya Ichwani, Julia L. Martin, Deborah O. Oyewole, Omolara V. Oyelade, Yusuf A. Olanrewaju, Dahiru M Sanni, Sharafadeen A. Adeniji, Ronald L. Grimm, Abdulhakeem Bello, Oluwaseun K. Oyewole, Esidor Ntsoenzok and Winston O. Soboyejo (2021): A Study of the Effects of a Thermally Evaporated nanoscale CsBr layer on the Optoelectronic Properties and Stability of Formamidinium-rich Perovskite Solar Cells, *AIP Advances*, 11, 095112
- Sharafadeen Adeniji, Oluwaseun Oyewole, **Richard Koech**, Deborah Oyewole, Jaya Cromwell, Ridwan Ahmed, Omolara Oyelade, Dahiru Sanni, Kingsley Orisekeh, Abdulhakeem Bello, Winston Soboyejo (2021). Failure Mechanisms of Stretchable Perovskite Light-Emitting Devices under Monotonic and Cyclic Deformations, *Journal Macromolecular Materials and Engineering*, 305 (30).
- D. O. Oyewole, **R. K. Koech**, Reisya Ichwani, Juan Hinostroza Tamayo Sharafadeen Adetunji Adeniji, Jaya Cromwell, Oluwaseun Kehinde Oyewole, Benjamin Agyei-Tuffour, Lyubov Titova, Nancy A. Burnham, Winston O Soboyejo (2021): Annealing Effects on the Interdiffusion in Layered in FA-Rich Perovskite Solar Cells, *AIP Advances*, 11, 065327
- Dahiru Sanni, Aditya Yerramilli, Esidor Ntsoenzok, Sharafadeen Adeniji, Omolara Oyelade, **Richard Koech**, Adebayo A Fashina, and Terry L. Alford (2021). Impact of precursor concentration on the properties of perovskite solar cells obtained from the dehydrated lead acetate precursors, *Journal of Vacuum Science and Technology*, 39, 032801
- S. A. Adeniji, J. Cromwell, D. O. Oyewole, O. V. Oyelade, **R. K. Koech**, D. M. Sanni, O. K. Oyewole, B. Babatope, W. O. Soboyejo (2021): Pressure-assisted fabrication of perovskite light emitting devices, *AIP Advances*, 11, 025112

- Dahiru Sanni, Esidor Ntsoenzok, Eddy Saintaimé, Sharafadeen Adeniji, Omolara Oyelade, **Richard Koech**, Daniel Amune, and Abdulhakeem Bello (2020): The role of hafnium acetylacetonate buffer layer on the performance of lead halide perovskite solar cells derived from dehydrated lead acetate as Pb source, *AIP Advances*, 10, 075006
- O. K. Oyewole, D. O. Oyewole, O. V. Oyelade, S. A. Adeniji, **R. K. Koech**, J. Asare, B. Agyei-Tuffour and W. O. Soboyejo (2020): Failure of Stretchable Organic Solar Cells Under Monotonic and Cyclic Loading, *Journal Macromolecular Materials and Engineering*, 305 (30).
- Kigozi Moses, **Richard K Koech**, Orisekeh Kingsley, Itohan Ojeaga, Tebandeke Emmanuel, Kasozi Gabriel and Peter A Onwualu (2020): Synthesis and characterization of graphene oxide from locally mined graphite flakes and its supercapacitor applications, *Results in Materials*, 7, 100113
- Abdulhakeem Bello, Dahiru Sanni, Sharafadeen Adeniyi, Victalis Anye, Kingsley Orisekeh, Moses Kigozi, **Richard Koech** (2020): Combustion synthesis of battery-type positive electrodes for robust aqueous Hybrid supercapacitor, *Journal of Energy storage*, 27, 101160.
- **R. K. Koech**, J. K Tonui, R. O Nyayieka & P. K. Macharia (2017): Assessment of the efficacy and impacts of Agrochemical and Food Company Ltd's wastewater treatment plant on the quality of water in the river Nyando, Kenya, *IJWR* 7(2), pp 48-52
- **R. K. Koech** (2016): Effects of thermal resistance of encapsulation material on the performance of a single pass PV/T Air system, *IJTRD*, Vol. 3, Issue 6
- G. K. Yegon¹, G. K. Arusei², **R. K. Koech**³ (2015): MOSFET Scaling to Sub-Micron Range; Analysis of Characteristic Curves in Relation to Device Parameters. *IJETAE*: Vol. 5, Issue 5, Pp. 500-503
- **R. K. Koech**, G.K Arusei, G. K. Yegon, J.K Tonui, S. K Rotich (2014): Photovoltaic/ Thermal (PV/T) System as Innovative Solution to increase Solar energy conversion efficiency. *IJETAE*: Vol. 4, Issue 10, pp 717-722.
- Ondieki H. O., **Koech R. K.**, Tonui J. K., Rotich S. K. (2014). Mathematical Modeling of Solar Air Collector with a Trapezoidal Corrugated Absorber Plate. *IJSTR*: Vol. 3, Issue 8.
- G.K Arusei, G.K Yegon, S.K. Rotich, R.K. Nixon, **R.K. Koech** and D.K Choge (2013): Elastic scattering reaction of $^4\text{He} + ^{10}\text{B}$ matrix, differential cross-section and reaction cross-section at laboratory energies of 5-15 MeV; an optical model analysis on partial wave scattering, *APTA*: Vol.23, pp. 11-18
- **R. K. Koech**, H. O Ondieki, J. K. Tonui, S. K Rotich (2012): A steady state thermal model for photovoltaic/thermal (PV/T) system under various conditions, *IJSTR*: Vol. 1, Issue 11.
- **R. K. Koech**, H. O Ondieki, J. K. Tonui, S. K Rotich (2012): Performance Analysis of a PV/T Air system based on heat transfer perspective, *IJSER*: Vol. 3, Issue 10.

Conferences Attended

- 1st – 3rd, November 2023: 2nd International Conference on Multidisciplinary Engineering and Applied Sciences (ICMEAS-2023)
Theme: Expanding the Digital World through Advances in Computing, Science, Technology, Engineering, & Mathematics (STEM) Education
- 20th – 23rd, June 2022: RSIF conference:
Theme: Power Economics and Energy Innovation in Africa, Bengueri, Morocco
Title of paper: Effects of PEO on the photophysical properties of perovskite solar cells
Science slam: Perovskite solar cells: A paradigm shift in photovoltaics
- 20th – 23rd, August 2019: IEEE PES/IAS Power Africa Conference:
Theme: Power Economics and Energy Innovation in Africa.
Title of paper: Recent advances in solar energy harvesting materials with particular emphasis on photovoltaic materials.
- 12th – 16th, November 2018: 17th Annual International Conference of the Materials Science and Technology Society of Nigeria (MSN).
Theme: Towards successful implementation of economic Recovery and Growth Plan: The Role of Secondary Raw Materials Development held at RMRDC Auditorium, Maitama, Abuja
- 10th, July 2018: National Technical Conference & Induction.
Theme: Cost engineering, Engineering Economy and Engineering valuation perspectives on sustainable engineering infrastructure for accelerated rural development organized by the Institute of Appraisers and Cost Engineers held at Symposium Hall, Maitama, Abuja
- 14th-15th June 2012: RVTTI 3rd Annual Conference.
Theme: Advances and challenges in the realization of millennium development goals.
Title of paper: A steady state thermal model for photovoltaic/thermal (PV/T) system under various conditions.
- 6th-10th, September 2011: Moi University International Annual Conference.
Theme: Achieving environmental Sustainability and Economic Development: *Global warming and climate change*.

Title of the paper- Parametric Studies of PV/T Solar Air Collector under Natural Flow Mode

Funded Research

- Additive-assisted Fabrication of Efficient and Stable Perovskite Solar Cells, JIRA Research Project: Funded by PASET-RSIF
- Water quality assessment along the river Nyando in the vicinity of ACFC Ltd in Muhoroni, Funded by Moi University- VLIR-UOS

Membership to Professional Bodies

- Member of Africa Materials Research Society (AMRS).
- Member of Institute of Electrical and Electronic Engineers (IEEE)
- Member of International Society for Development and Sustainability (ISDS)

**Community
Service**

- BOM member: Gorgor Secondary School
 - BOM member: Kipsingei Secondary School
-

REFEREES

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